

# Exploring responses to the need for new antibiotics: How do different incentives compare?

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“Collaboration for Innovation – The Urgent Need for New Antibiotics”

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# LSE Report 2009

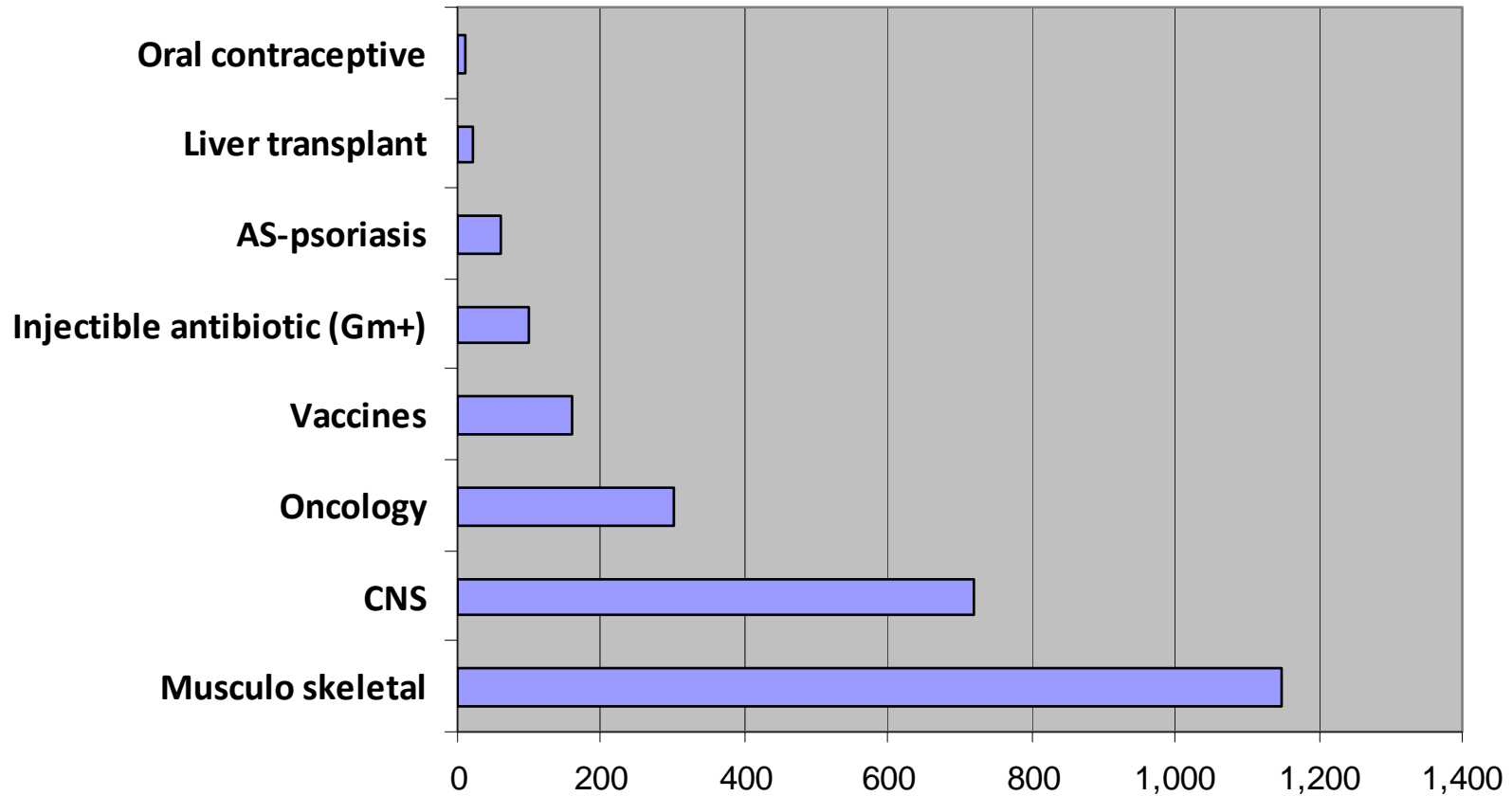
- ‘Policies and Incentives to promote innovation in antibiotic research’

# Background: Why are so few new antibiotics being developed?

- Regulatory environment
  - Lack of diagnostics
  - Low tolerance for side effects
  - Lack of clear guidelines
  - Shifting of requirements
- Perceived low profitability
  - Generics
  - Conservation policies
  - Short duration of treatment and low relative prices



# Net present value estimations



Risk adjusted NPV x \$1,000,000, Source Projan 2003

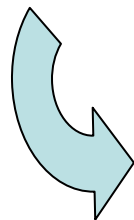
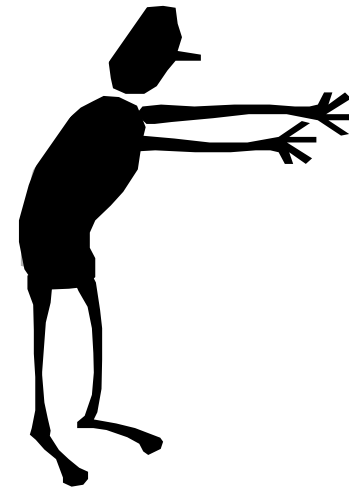
# Is there justification for intervention in the market?

- High probability of an impending health crisis
- Market failures
- Unattractiveness of the market
- High cost of resistance

# Types of financial intervention

*pull*  
*lego-regulatory*

*push*



*combinations*



<u>PUSH</u>	1. Grants and fellowships
	2. Funding for translational research
	3. Support for open-access research
	4. Product development partnerships
	5. Research-related tax incentives
<u>PULL</u>	6. Monetary End Prizes (MEP)
	7. Health Impact Fund (HIF)
	8. Buy-Out (BO)
	9. Patent pool
	10. Research tournaments
	11. Advanced market commitments (AMC)
<u>LEGO- REGULATORY (PULL)</u>	15. Accelerated assessment
	16. Accelerated approval
	17. Vouchers for accelerated assessment
	18. Pricing & Reimbursement adjustments (P&R)
	19. IP extensions
	20. Wildcard patent extensions
	21. Anti-trust waivers
	22. Antibiotics and Conservation Effectiveness model (ACE)
<u>HYBRID PUSH- PULL</u>	12. Call Options for Antibiotics model (COA)
	13. Orphan drug legislation (OD)
	14. Special designation for priority antibiotics (SDA)

Report: ‘A strong pull mechanism complemented by some push funding (either as part of hybrid mechanism or combined within a package of incentives)’

Shortlist:

Pull incentives (including lego-regulatory incentives)

1. Monetary End Prizes (MEP)
2. Buy-Outs (BO)
3. Advanced Market Commitments (AMC)
4. Health Impact Fund (HIF)
5. Pricing and Reimbursement adjustments (P&R)
6. Antibiotic Conservation and Effectiveness programme (ACE)

Push-pull incentives

7. Orphan Drug incentives (OD)
8. Call Options for Antibiotics model (COA)
9. Special Designation for priority Antibiotics incentives (SDA)



# Criteria for comparative assessment

- Decoupling of profits and the recouping of R&D costs from sales
- Decoupling of profits and the recouping of R&D costs from prices
- Share risk between funder and developer
- Likely beneficiaries
- Achieve political support
- Encourage purchase of best drug available on market
- Use market to determine optimal reward size or need for external financing of the incentive
- Offer rewards solely for successful research
- Avoid principal-agent problems
- Promote clear communication surrounding priorities and willingness to pay
- Help overcome Tragedy of the Commons
- Encourage competition
- Encourage follow-on innovation
- Estimated relative transaction costs associated with implementation of the incentive
- Expected timeframe to implement the incentive
- Amount of new legislation or institutional infrastructure required
- Issues surrounding the incentive's potential to spur desired R&D in the short-term
- Clear hurdles and barriers
- Experiences with mechanism to date

# Monetary prizes

## *FOR*

Reward only successful research

The adoption of milestone payments can help recoup investment costs earlier, reducing the risk to the developer

Conditions such as prohibition of marketing activities or pricing could be added (but will increase the necessary magnitude)

## *AGAINST*

Ex ante calculation of prize amount poses numerous challenges

All risk is borne by the developer

The adoption of milestone payments increases the risk of subsidizing research that never reaches the market

# Buy-out

## *FOR*

Reward only successful research

Decouples sales from the recouping of R&D costs which can improve socially beneficial market segmentation (e.g. between rich and poor countries) and help reduce over-marketing

## *AGAINST*

Ex ante calculation of prize amount poses numerous challenges

All risk is borne by the developer

# Advanced Market Commitments (AMC)

## *FOR*

- Predetermined price/volume reduces risk to developer
- Align incentives for the funder, developer and user early in the development process
- Reward only successful research
- May increase size of market

## *AGAINST*

- Commitment may lead to rewarding the development of a product that is ultimately of lesser quality than another that has been developed in the interim
- Pressure for developer to sell enough to move beyond the units covered in contract
- Risk of over-purchase of product leading to political risks and pressures to absorb drug within health system (may require stockpiling)

# Pricing & Reimbursement reforms

## *FOR*

Could allow for prices to better reflect the true value of antibiotics

No requirement to quantify size of reward outright

Direct influence on prescribers and patients could help reduce over-prescription/consumption

Avoids “incentive creep”

## *AGAINST*

Member States individually too small to affect market

Incentive much stronger if can be done on a European level but would be challenged on basis of subsidiarity (so would be very challenging)

# Orphan drug (package)

(eligibility <5 in 10,000 pop)

- Fee waivers
- Scientific advice
- Access to central approval
- Tax incentives at MS level
- Extended market exclusivity

## *FOR*

Successful for rare diseases  
(small markets)

## *AGAINST*

- Prices may be unjustifiably high
- Current abuse of legislation
- Opposition to application of market exclusivity component
- Has been unsuccessful so far for antibiotics

# Special Designation for priority antibiotics (package)

- Fee waivers
- Scientific advice
- Access to central approval
- Tax incentives at MS level
- Extended data exclusivity
- Fair pricing condition tied to exclusivity
- Marketing prohibited
- (for very small markets can add an EU purchase commitment)

## *FOR*

- Similar incentives to orphan legislation but without most contentious pieces and without the rarity barrier
- EMA experience with similar mechanisms
- Fair pricing component can help Europe influence the price of the drug in poorer countries while maintaining a “light touch”

## *AGAINST*

- Dependent on reasonable market size

# Call Options model for Antibiotics

## *FOR*

- Risk-sharing between funders and developer
- Lowers barriers to entry
- Spreading cost of drug purchase may render it more fiscally feasible than other pull mechanisms and improve externally perceived viability/credibility
- Quality markers allow for magnitude of reward to be a function of innovation

## *AGAINST*

- Relies on thorough evaluation of potential products (which is potentially hindered by asymmetry of information)
- Risk of gaming (although this may be mitigated by reputation concerns)
- Higher prices would be faced by those not taking part in the options scheme
- Commitment may lead to rewarding the development of a product that is ultimately of lesser quality than another that has been developed in the interim



# Antibiotic Conservation and Effectiveness (ACE) Programme (package)

- Value-based reimbursement, tied to antibiotic stewardship and infection control
- Market exclusivity tied to drug efficacy
- Limited antitrust waivers

## *FOR*

- Aligns industry incentives with public health incentives

## *AGAINST*

- Politically difficult to implement

# Health Impact Fund

## *FOR*

- Complete separation of prices from recouping of R&D costs and profits
- Would lead R&D towards areas where gains would be greatest
- Improve access through low prices

## *AGAINST*

- Reward tied to sales
- Explicit incentives to market

# Conclusions

- The EU should not be afraid to go it alone
- Several trade-offs will need to be made but need to act
- There is currently an appetite for bold moves to be made
- In longer term need overall re-alignment of overall investment drivers with therapeutic need

# Thank you

Current LSE group projects related to antibiotics (email [C.M.Morel@lse.ac.uk](mailto:C.M.Morel@lse.ac.uk) for details)

- Estimation of antibiotic market sizes
- Exploration of supply and demand bottlenecks within diagnostics market
- Analysis of global fair pricing strategies